

METHODS OF ORIENTING AN EASY AXIS OF A HIGH-ASPECT RATIO
WRITE HEAD FOR IMPROVED WRITING EFFICIENCY

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ABSTRACT OF THE DISCLOSURE

A pole piece of a magnetic write head is formed over a substrate and includes a pole tip having a width that is less than its height which is normal the substrate. Due to stress-anisotropy, the pole tip structure has an inherent easy-axis which is oriented in an unfavorable direction (i.e. perpendicular to the ABS and almost collinear with a driving
10 field of the write head). To alleviate this problem, during electroplating or annealing of the pole piece a magnetic field is applied to the pole tip in a direction which is out-of-plane from the substrate but in-plane with a side wall of the pole tip which vertically projects from the substrate. By applying the magnetic field in this manner, the easy axis of the pole piece is oriented in the direction of the applied magnetic field to facilitate
15 more efficient switching in the write head. Ideally, the angle θ is about 90° for Hexagonal-Closed Packed (HCP) materials or about 50° for Face-Centered Cubic or Body-Centered Cubic (BCC) materials (e.g. NiFe and CoFe).